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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/590,314 | 08/23/2006 | Taro Yamamoto | 29445US26PCT | 8111 |
| 22850 | 7590 | 05/21/2009 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | MATHEWS, ALAN A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2851 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/590,314 | YAMAMOTO ET AL. | |
| | Examiner | Art Unit | |
| | ALAN A. MATHEWS | 2851 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 18-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 18-22,24-31 and 33-36 is/are rejected.
- 7) Claim(s) 23 and 32 is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 23 August 2006 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/23/06 & 4/1/09</u> . | 6) <input type="checkbox"/> Other: ____ . |

DETAILED ACTION

Drawings

1. The drawings are objected to because the numerals "51" and "52" in figures 8(a) and 8(b) do not correspond to page 17 of the specification. The slit in figure 8(a) appears to be designated by numeral 51, and the nozzle appears to be designated by numeral 52. But the specification has designated numeral 51 as the nozzle and element 51a as the slit. Furthermore, numeral "52" was previously designated as a temperature regulator on page 10 of the specification. Also, figure 5 appears to be designating the nozzle by numeral "52", which was previously designated as a temperature regulator. **Applicant should carefully review the drawings and the specification to clarify the confusion between numerals 51, 51a, and 52.** Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the

remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 18-22, 24-31, and 33-36 are rejected under 35 U.S.C. 102(a) as being anticipated by Shigemori et al. (U.S. Patent No. 6,558,053). Figures 3 and 4 and column 14, lines 9-34, and column 15, lines 11-18, disclose a coating unit 5 for coating a surface of a substrate W with a resist by resist supplying nozzle 9. Figures 3 and 4 further disclose a developing unit 2 for processing the substrate W after exposing the substrate (see column 15, line 66 for the “exposing”). It is further noted that no exposing unit has been positively recited, and therefore, “with a transparent liquid layer” has not been given any patentable weight. Column 15, lines 29-47 disclose a first cleaning means 6 for cleaning the surface of the substrate coated with resist by using a solvent from nozzle 13 to remove components of the resist before exposure. It is further

noted that the expression "that may dissolve in the liquid layer" is functional and has not been given any patentable weight as written. It is also noted that in a different embodiment, figures 9, 10, and 11 and column 22 and column 23 disclose a coating unit 116 and a rinsing unit (first cleaning means) 117. With respect to claim 19, figure 4 discloses a substrate holding device (spin chuck) 7 holding the substrate W in horizontal position and rotating the substrate. The resist pouring nozzle is element 9. With respect to claim 20, figures 3 and 4 disclose a vessel holding the substrate at element 6. A substrate support device (spin chuck) 11 holds the substrate in a horizontal position. The cleaning liquid supply means includes nozzle 13 and the cup 12 has a liquid discharging means to discharge the cleaning liquid. With respect to claim 21, figure 4 discloses a heating unit 3 adjacent the first cleaning means 6. With respect to claim 22, column 20, lines 44 and 45 state in another embodiment, "The coating film may be dried by using a blower or the like". A blower would have flowing dry gas. With respect to claim 24, column 15, lines 20-47 disclose a drying means. With respect to claim 25, figure 9 discloses an interface 104 for transferring the substrate coated with the resist to an exposure system STP. With respect to claims 28-31 and 33-36, these method steps correspond to the operation of apparatus claims 18-22 and 24-27 discussed above.

4. Claims 18-21, 24-30, and 33-36 are rejected under 35 U.S.C. 102(a) as being anticipated by Hirose et al. (U. S. Patent Application Publication No. 2003/0079764 A1, cited in one of Applicant's IDSs and cited as an X reference in a Search Report filed

4/1/09). Figures 1 and 2 and paragraph # 0068 disclose a coating unit COT for coating a substrate with a resist and a developing unit DEV for developing the substrate.

Element 50 is the first group G1 is a first cleaning means 50 for cleaning the surface of the substrate before exposing (see figure 2 and figures 4 - 6 and paragraphs # 0005 and # 0044). It is further noted that no exposing unit has been positively recited, and therefore, "with a transparent liquid layer" has not been given any patentable weight. It is also further noted that the expression "that may dissolve in the liquid layer" is functional and has not been given any patentable weight as written. With respect to claim 19, the spin chuck disclosed in paragraph # 0068 is a substrate holding device. With respect to claim 20, figure 4 discloses a closable vessel 68 with an opening 68a and a closing member 69 for the opening 68a (see paragraph # 0072). Figure 6 discloses a spin chuck 71 for holding the substrate in a horizontal position. Nozzles 35 and 36 provide cleaning liquid. Alternatively element 83 (a second cleaning means) could provide a cleaning liquid (see figure 15). Element 75 is a drain or a liquid discharge means. Element HP is a heat processing unit (which could also be a drying process). Element 12 in figure 1 is the interface that transports the substrate to an exposure process. With respect to claims 28-31 and 33-36, these method steps correspond to the operation of apparatus claims 18-22 and 24-27 discussed above.

5. Claims 18 - 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Takamori et al. (U.S. Patent No. 6,443,641). Takamori et al. discloses in figure 5 and column 7, lines 20-60, a resist nozzle 57 (with resist supply 99) which is considered to

be a coating unit and a solvent nozzle 58 (with solvent supply 101) which is considered to be a first cleaning means for cleaning the surface of the substrate coated with the resist. In addition, the edge removing unit ER in figure 1 is considered to be a cleaning means. Elements 24a, 24b, and 24c in figure 1 are developing units. It is further noted that no exposing unit has been positively recited, and therefore, "with a transparent liquid layer" has not been given any patentable weight. With respect to claim 19, spin chuck 51 is a substrate holding device (see figure 5). With respect to claim 20, figure 3 discloses a closable vessel for unit 22 which has cleaning nozzle 58. With respect to claim 21, elements HP are heating units. With respect to claim 22, figure 6 and column 7, lines 55-67, disclose that element 80 is a drying means which sprays gas.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 18-22, 24-31, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigemori et al. (U.S. Patent No. 6,558,053) in view of the Japanese patent document JP 10-303114 (cited in one of Applicant's IDSs, with an English translation being provided with this office action) or Takahashi (U.S. Patent No. 5,610,683). Shigemori et al. discloses in figures 3 and 4 and column 14, lines 9-34, and

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column 15, lines 11-18, disclose a coating unit 5 for coating a surface of a substrate W with a resist by resist supplying nozzle 9. Figures 3 and 4 further disclose a developing unit 2 for processing the substrate W after exposing the substrate (see column 15, line 66 for the "exposing"). Column 15, lines 29-47 disclose a first cleaning means 6 for cleaning the surface of the substrate coated with resist by using a solvent from nozzle 13 to remove components of the resist before exposure. It is also noted that in a different embodiment, figures 9, 10, and 11 and column 22 and column 23 disclose coating unit 116 and a rinsing unit (first cleaning means) 117. With respect to claim 19, figure 4 discloses a substrate holding device (spin chuck) 7 holding the substrate W in horizontal position and rotating the substrate. The resist pouring nozzle is element 9. With respect to claim 20, figures 3 and 4 disclose a vessel holding the substrate at element 6. A substrate support device (spin chuck) 11 holds the substrate in a horizontal position. The cleaning liquid supply means includes nozzle 13 and the cup 12 has a liquid discharging means to discharge the cleaning liquid. With respect to claim 21, figure 4 discloses a heating unit 3 adjacent the first cleaning means 6. With respect to claim 22, column 20, lines 44 and 45 state in another embodiment, "The coating film may be dried by using a blower or the like". A blower would have flowing dry gas. With respect to claim 24, column 15, lines 20-47 disclose a drying means. With respect to claim 25, figure 9 discloses an interface 104 for transferring the substrate coated with the resist to an exposure system STP. With respect to claims 28-31 and 33-36, these method steps correspond to the operation of apparatus claims 18-22 and 24-27 discussed above. Thus, Shigemori et al. discloses the invention except

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for specifically disclosing an exposure unit that would expose a substrate through a transparent liquid (although the Examiner strongly argues that this is not required of the claims as they are currently written). The Japanese patent document JP 10-303114 discloses in figure 1 the well-known concept of exposing a substrate through a liquid LQ. Takahashi discloses in figures 1 and 2 the well-known concept of exposing a substrate 2 through a liquid 23. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to expose a substrate through a liquid in Shigemori et al. in view of either the Japanese patent document JP 10-303114 or Takahashi for the purpose of improving resolution of the details of the circuit and thus obtain a better final product.

Allowable Subject Matter

8. Claims 23 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The reasons for the indicated allowability of the claims are as follows:

The prior art does not disclose or suggest does not disclose or suggest a cleaning nozzle provided with pouring openings arranged along the width of the substrate to pour the cleaning liquid onto the surface of the substrate held by the substrate holding device, and suction openings arranged adjacently to the

pouring openings on the front and/or back side of the pouring openings to suck up the cleaning liquid from the surface of the substrate, and a cleaning nozzle moving means for horizontally moving the cleaning nozzle relative to the substrate holding device in combination with all the other elements recited in dependent claim 23 and the parent claim from which claim 23 depends.

The prior art does not disclose or suggest wherein the first cleaning process moves horizontally a cleaning nozzle provided with pouring openings through which a cleaning liquid is poured onto the surface of the substrate and sucks the cleaning liquid poured onto the substrate through suction openings arranged adjacently to the pouring openings on the front and/or the back side of the discharge openings in combination with all the other steps recited in the parent claim to dependent claim 32.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents cited in the PTO-1449s are cited for the same reasons they were cited in Applicant's IDSs).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN A. MATHEWS whose telephone number is

(571)272-2123. The examiner can normally be reached on Monday through Friday from 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571) 272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan A. Mathews/
Primary Examiner
Art Unit 2851

AM